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# United States Patent [19]

Alving et al.

[11] Patent Number: **5,820,880**[45] Date of Patent: **Oct. 13, 1998**[54] **LIPOSOMAL FORMULATION**[75] Inventors: **Carl R. Alving**, Bethesda; **Jean M. Muderhwa**, Silver Spring, both of Md.[73] Assignees: **The United States of America as represented by the Secretary of the Army**, Washington, D.C.; **Jenner Technologies**, Danville, Calif.[21] Appl. No.: **480,563**[22] Filed: **Jun. 7, 1995**[51] Int. Cl.<sup>6</sup> ..... **A61K 9/127**; A61K 33/06; A61K 39/385; A61K 9/66[52] U.S. Cl. ..... **424/450**; 424/184.1; 424/277.1; 424/278.1; 424/283.1; 436/829; 514/2; 514/885; 514/964

[58] Field of Search ..... 424/450, 184.1, 424/277.1, 278.1, 283.1; 514/885, 964, 2; 436/829

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[57] **ABSTRACT**

Depending on the antigen encapsulated, liposomal formulations are subject to instability in the presence of alum. Formulations containing a nonionic detergent as a stabilizing agent avoid this instability.

**8 Claims, 8 Drawing Sheets**